Amendments to the Claims:

Please amend claims 1, 2, 4, 6-13, 16, 17, 19, 20 and 22 as indicated below.

Please cancel claims 3, 5, 21 and 23-25.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An interference microscope, comprising:

- a first and a second objective respectively disposed on opposite sides of a specimen;
- ~~at least one~~ a specimen support unit, the specimen support unit including first and second cover glasses configured to hold the specimen therebetween;
- ~~a specimen being provided and associated with the specimen support unit and,~~
- at least one coating disposed on at least one planar ~~area is provided for determination of an illumination state in the specimen in the interference microscope wherein the at least one planar area is a surface on the specimen support unit and is configured to be detectable by light microscopy~~ surface of the first cover glass facing the specimen; and
- at least one detector configured to detect light reflected or induced at the coating so as to measure an intensity signal profile as a function of an axial position of the at least one coating.

Claim 2 (currently amended): The interference microscope as defined in Claim 1 wherein the microscope ~~consists of~~ includes at least one of a 4π microscope, a standing wave field microscope, ~~a I^2M, I^3M, or I^5M~~ an Image Interference Microscopy microscope, an Incoherent Interference Illumination Microscopy microscope, and a combination Image Interference Microscopy and Incoherent Interference Illumination Microscopy microscope.

Claim 3 (canceled)

Claim 4 (currently amended): The interference microscope as defined in Claim 1, wherein the ~~planar area,~~ coating is embodied in at least partially reflective fashion.

Claim 5 (canceled)

Claim 6 (currently amended): The interference microscope as defined in Claim [[5]] 4, wherein the ~~surface~~ coating has a defined reflectance that ~~preferably~~ is constant.

Claim 7 (currently amended): The interference microscope as defined in Claim [[5]] 4, wherein the coating ~~of the surface~~ is configured in wavelength-dependent fashion so that light of at least one wavelength can be reflected.

Claim 8 (currently amended): The interference microscope as defined in Claim [[5]] 4, wherein a metallic or dielectric coating is provided.

Claim 9 (currently amended): The interference microscope as defined in Claim [[5]] 4, wherein a dielectric or metallic/dielectric hybrid coating is provided.

Claim 10 (currently amended): The interference microscope as defined in Claim 1, wherein the at least one ~~surface~~ coating ~~of the specimen support unit~~ comprises at least one layer that can be excited to ~~luminesce, in particular to~~ fluoresce.

Claim 11 (currently amended): The interference microscope as defined in Claim 10, wherein the ~~surface~~ coating comprises ~~several~~ a plurality of luminescent layers differing in their luminescent properties.

Claim 12 (currently amended): The interference microscope as defined in Claim ~~10~~ 11, wherein at least one of the plurality of luminescent ~~layer~~ layers can be excited to luminesce with light of a light source.

Claim 13 (currently amended): The interference microscope as defined in Claim 1, wherein the at least one coating is configured to have light ~~is~~ induced ~~at a planar area of the specimen support unit~~ therein by way of a nonlinear ~~processes~~ process.

Claim 14 (original): The interference microscope as defined in Claim 13, wherein the nonlinear process is coherent anti-Stokes Raman scattering (CARS).

Claim 15 (canceled)

Claim 16 (currently amended): The interference microscope as defined in Claim [[3]] 1, wherein the light reflected or induced at the ~~planar area~~ coating can be detected with an additional detector.

Claim 17 (currently amended): The interference microscope as defined in Claim 16, wherein the light reflected or induced at the ~~planar area~~ coating is, by means of an optical component, switched out of ~~the~~ a detected or illuminating beam path of the interference microscope and conveyed to an additional detector.

Claim 18 (original): The interference microscope as defined in Claim 17, wherein a glass plate, a dichroic beam splitter, a filter, a prism, a grating, or a spectrally sensitive arrangement is provided as the optical component.

Claim 19 (currently amended): The interference microscope as defined in Claims [[15]] 1, wherein a pinhole is arranged in front of the detector.

Claim 20 (currently amended): The interference microscope as defined in Claim 19, wherein the pinhole is arranged in a plane corresponding to ~~the~~ a specimen plane of an objective of the first and second objectives.

Claim 21 (canceled)

Claim 22 (currently amended): The interference microscope as defined in Claim 1, wherein at least one ~~additional~~ light source is provided as a laser for determining ~~the illumination state~~ an intensity profile in a specimen region of the interference microscope.

Claims 23-25 (canceled)

Claim 26 (withdrawn): A method for operating an interference microscope with at least one objective comprising the steps of:

- providing at least one specimen support unit associated with a specimen,
- positioning the specimen together with the specimen support unit in such a way that a planar area of the specimen support unit is located in the focus region of an objective of the interference microscope, and
- determining the illumination state in a specimen region of the interference microscope on the basis of at least one planar area of the specimen support unit.

Claim 27 (withdrawn): The method as defined in claim 26, wherein the interference microscope is a 4π microscope, a standing wave field microscope, or I^2M, I^3M, or I^5M microscope.

Claim 28 (withdrawn): The method as defined in claim 26 wherein the specimen support unit is configured as a surface.

Claim 29 (withdrawn): The method as defined in Claim 28, wherein the determination of the illumination state in the specimen region of the interference microscope is accomplished on the basis of the light reflected or induced at the planar area, by the fact that an intensity signal profile is detected as a function of the axial position of the planar area.

Claim 30 (withdrawn): The method as defined in Claim 29, wherein for detection of the axial intensity signal profile, the specimen together with the specimen support unit is moved along the optical axis of the objective or objectives; and the light reflected and/or induced by the planar area is detected in that context.

Claim 31 (withdrawn): The method as defined in Claim 29, wherein several axial intensity signal profiles are detected at at least one point of the focal plane.

Claim 32 (withdrawn): The method as defined in Claim 29, wherein several detections of axial intensity signal profiles are performed during a specimen detection.

Claim 33 (withdrawn): The method as defined in Claim 29, wherein the detected axial intensity signal profile is evaluated using an algorithm.

Claim 34 (withdrawn): The method as defined in Claim 33, wherein the algorithm determines the height of the signal at the center point of the intensity signal profile.

Claim 35 (withdrawn): The method as defined in Claim 29, wherein the interference microscope is aligned as a function of the illumination state in the specimen region.

Claim 36 (withdrawn): The method as defined in Claim 35, wherein alignment of the interference microscope is performed in such a way that constructive interference is present in the illumination focus, preferably using a corresponding control system.

Claim 37 (withdrawn): The method as defined in Claim 36, wherein the alignment is accomplished by means of an optical path length change of an interferometer beam path segment.

Claim 38 (withdrawn): The method as defined in Claim 36, wherein the detection and alignment operations are repeated and are coordinated with the drift behavior of the interference microscope.